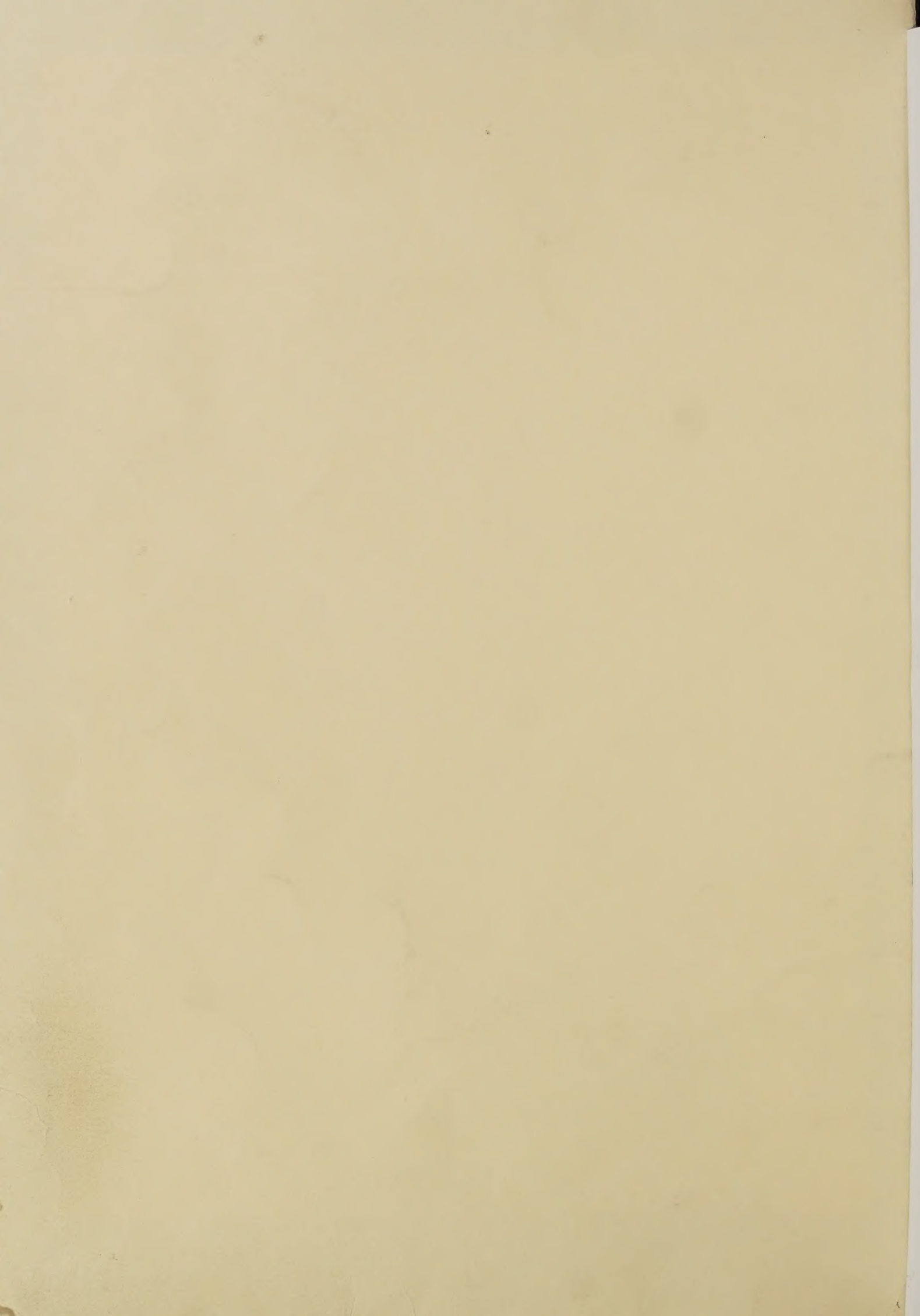


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Injection Practices on U.S. Beef Cow-calf Operations, 2007–08

The U.S. beef industry has engaged in efforts to ensure the quality of beef products for many years. One such effort, the Beef Quality Assurance (BQA) program, was built on the model of the Hazard Analysis and Critical Control Point (HACCP). The HACCP approach addresses a variety of issues ranging from antibiotic residues and food safety pathogens to injection blemishes in finished product.

Based on the findings of the first National Beef Quality Audit in 1991, injection-site blemishes were identified as an issue of great concern to processors and purveyors of beef products. To address this issue, the industry facilitated a number of research efforts to define the cause (products or product types) of these blemishes and to identify effects on product quality other than appearance (e.g., tenderness, residues). In addition, the industry developed BQA-program components to eliminate injection blemishes to the extent possible. At the producer level, the BQA program encouraged use of subcutaneous injections in lieu of intramuscular injections whenever possible and also suggested that all injections should be given in the neck region.

The U.S. Department of Agriculture's National Animal Health Monitoring System (NAHMS) conducted the Beef 2007–08 study, which focused on beef cow-calf health and management practices in 24 States.* These States represented 79.6 percent of U.S. operations with beef cows and 87.8 percent of U.S. beef cows.

One objective of the Beef 2007–08 study was to describe current injection practices on cow-calf operations and to compare those with injection practices reported from the previous NAHMS study of cow-calf operations conducted in 1997 (Beef '97).

*States:

Alabama, Arkansas, California, Colorado, Florida, Georgia, Idaho, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, Oregon, South Dakota, Tennessee, Texas, Virginia, and Wyoming.

Injections given by operators and veterinarians

The percentage of operations in which the operator or any unpaid or hired worker gave injections to any beef cattle during the previous 12 months, and the percentage of cows that resided on these operations, increased from 1997 to 2007 (table 1).

Table 1. Percentage of Operations, and Percentage of Cows on These Operations, in which the Operator or Any Unpaid or Hired Worker Gave Injections to Beef Cattle During the Previous 12 Months

Question variation	Beef '97 ^{1,2}	Beef 2007-08 ³
	Percent	Percent
	Injections to any beef cattle	Injections to any beef cows or unweaned calves
Operations	66.9	81.5
Cows	84.3	89.3

¹Population: all cow-calf operations in 23 States.

²Data collected in Beef '97 were for injections given in 1996.

³Population: all cow-calf operations in 24 States.

There was no substantial change from 1997 to 2007 in the percentage of operations in which a veterinarian gave injections to beef cattle during the previous 12 months, while the percentage of cows that resided on these operations decreased from 1997 to 2007 (table 2).

Table 2. Percentage of Operations, and Percentage of Cows on These Operations, in which a Veterinarian Gave Injections to Beef Cattle During the Previous 12 Months

	Beef '97 ^{1,2}	Beef 2007-08 ³
	Percent	Percent
Question variation	Injections to any beef cattle	Injections to any beef cows or unweaned calves
Operations	36.2	35.0
Cows	48.4	38.5

¹Population: all cow-calf operations in 23 States.

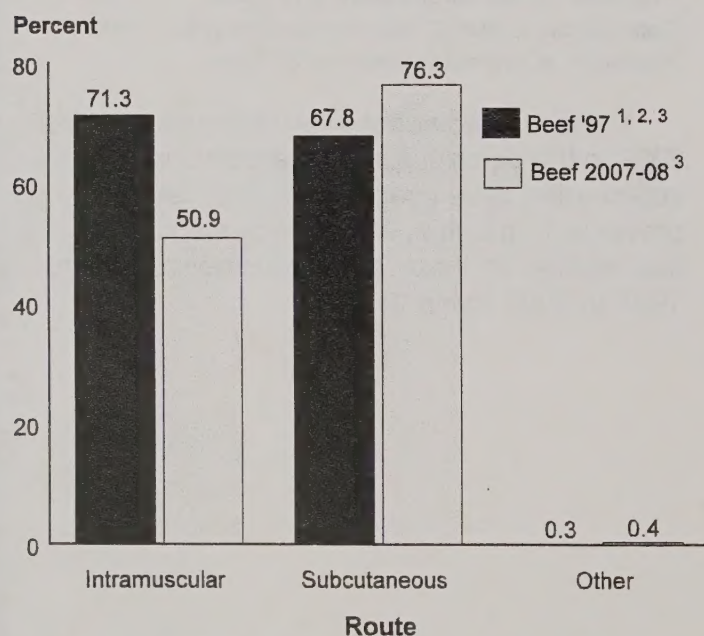
²Data collected in Beef '97 were for injections given in 1996.

³Population: all cow-calf operations in 24 States.

Route of injections

From 1997 to 2007, the percentage of operations in which the operator or any unpaid or hired worker gave injections by the intramuscular route during the previous 12 months decreased and the percentage that gave injections by the subcutaneous route increased (figure 1). These changes may be due to BQA educational efforts and/or the increased availability of products labeled for subcutaneous use.

Figure 1. For Operations in which the Operator or Any Unpaid or Hired Worker Gave Injections to Beef Cattle During the Previous 12 Months, Percentage of Operations that Gave One or More Injections, by Route of Injection



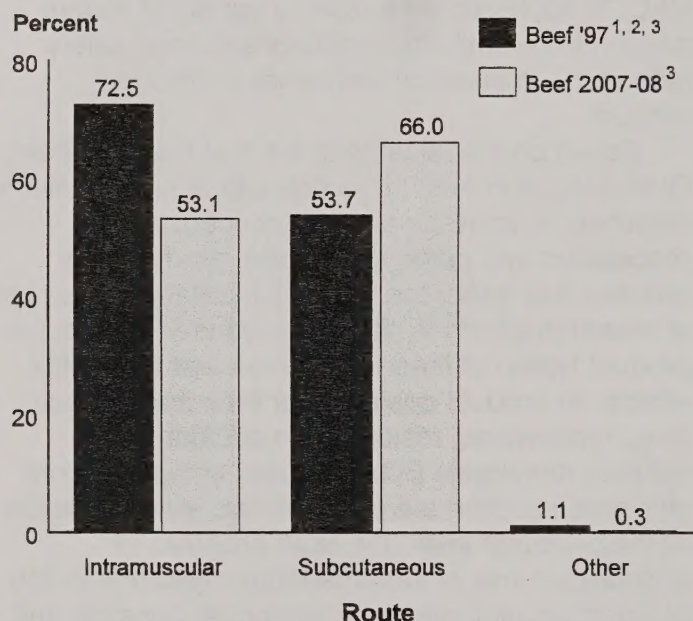
¹Population: all cow-calf operations in 23 States.

²Data collected in Beef '97 were for injections given in 1996.

³Question variation: For 1997, injections given to any beef cattle; for 2007, injections given to any beef cows or unweaned calves.

The percentage of operations in which a veterinarian gave injections intramuscularly during the previous 12 months decreased from 1997 to 2007, while the percentage of operations in which a veterinarian gave injections subcutaneously increased from 1997 to 2007 (figure 2). These changes may be due to BQA educational efforts and/or the increased availability of products (biologics or pharmaceuticals) labeled for subcutaneous use.

Figure 2. For Operations in which a Veterinarian Gave Injections to Beef Cattle During the Previous 12 Months, Percentage of Operations that Gave One or More Injections, by Route of Injection



¹Population: all cow-calf operations in 23 States.

²Data collected in Beef '97 were for injections given in 1996.

³Question variation: For 1997, injections given to any beef cattle; for 2007, injections given to any beef cows or unweaned calves.

Location and route of injections

Importantly, the Beef 2007–08 study showed that when injections were given *intramuscularly* by the operator or any unpaid or hired worker, the neck was the primary location used, a dramatic change from the intramuscular injection practices reported in the Beef '97 study. The percentage of operations in which the operator or any unpaid or hired worker gave intramuscular injections in the neck region nearly doubled from 1997 to 2007. The percentages of operations by usual location for *subcutaneous* injections given by the operator or any unpaid or hired worker were similar in 1997 and 2007 (table 3).

Table 3. For Operations in which the Operator or Any Unpaid or Hired Worker Gave Injections to Beef Cattle During the Previous 12 Months, Percentage of Operations by Usual Location and Route of Injection

Question variation	Beef '97 ^{1,2}		Beef 2007-08 ³	
	Percent		Percent	
	Injections to any beef cattle		Injections to any beef cows or unweaned calves	
	Route		Route	
Location	IM	SQ	IM	SQ
Neck	35.2	78.1	64.7	84.4
Shoulder	17.1	13.3	13.5	11.4
Upper rear leg/hip	42.8	4.6	19.9	3.1
Lower rear leg	4.6	1.7	1.8	0.2

¹Population: all cow-calf operations in 23 States.

²Data collected in Beef '97 were for injections given in 1996.

³Population: all cow-calf operations in 24 States.

The percentage of operations in which a veterinarian usually gave **intramuscular** injections in the neck increased from 1997 to 2007, while the percentage of operations in which intramuscular injections were given in the upper rear leg decreased. For each injection location category, the percentages of operations by usual location for **subcutaneous** injections given by a veterinarian were similar for both studies (table 4).

Table 4. For Operations in which a Veterinarian Gave Injections to Beef Cattle During the Previous 12 Months, Percentage of Operations by Usual Location and Route of Injection

Question variation	Beef '97 ^{1,2}		Beef 2007-08 ³	
	Percent		Percent	
	Injections to any beef cattle		Injections to any beef cows or unweaned calves	
	Route		Route	
Location	IM	SQ	IM	SQ
Neck	49.8	82.2	76.8	87.0
Shoulder	12.9	10.5	11.2	10.1
Upper rear leg/hip	34.8	5.7	10.3	2.0
Lower rear leg	2.1	0.8	1.7	0.0

Summary

The percentage of operations in which the operator or any unpaid or hired worker gave injections to any beef cattle during the previous 12 months, and the percentage of cows that resided on these operations, increased from 1997 to 2007. There was no change from 1997 to 2007 in the percentage of operations in which a veterinarian gave injections to any beef cattle during the previous 12 months, while the percentage of cows that resided on these operations decreased from 1997 to 2007.

The percentage of operations in which the intramuscular route was used for injections given by the operator or a veterinarian decreased between 1997 and 2007. When the intramuscular route of injection was used by the operators or veterinarians in 2007, the majority of operations used the neck as the usual location for these injections. The same was true for the injections delivered by the subcutaneous route. Both the decreased use of the intramuscular route of injection and the shift to the neck as the primary site of injection for intramuscular and subcutaneous injections are in agreement with the BQA guidelines developed by the industry to enhance the quality and marketability of beef products.

More information on injection practices is available in NAHMS' "Beef 2007-08 Part III: Changes in the U.S. Beef Cow-Calf Industry, 1993-2008" report, available at: <http://nahms.usda.gov>.

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